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ABSTRACT

Process evaluation has great potential to meet the needs of managers who are charged with operating employment and training programs under the Job Training Partnership Act (JTPA). One adaptation of process evaluation could make use of a personal computer to enhance the cost-effectiveness and quick turn-around time of this method of assessing the progress of job training programs. Advantages of process evaluation include the following: (1) it is helpful in diagnosing problems before they become serious; (2) it is cost effective; and (3) it closes the performance feedback loop quickly. JTPA managers implementing a process evaluation system must make choices, such as choosing what to evaluate, selecting appropriate evaluation measures, selecting an evaluation procedure, and integrating evaluation findings for program improvement. Solving the problems encountered during process evaluation requires computerization of evaluation activities, standardization of process evaluation criteria, independent local evaluation, and enhanced staff attitudes toward evaluation. (KC)

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Using A High Technology Process Evaluation In Employment and Training Programs

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Abstract

The process evaluation has great potential to meet the needs of managers who are charged with operating employment and training programs under the Job Training Partnership Act (JTPA). One adaptation of process evaluation could make the use of the personal computer to enhance the cost effectiveness and quick turn around time of this method of assessing the progress of job training programs.

This article discusses the pros and cons of the process evaluation approach for JTPA funded employment and training programs and suggests a computerized approach to program evaluation.

Using High Technology Process Evaluation In Employment And Training Programs

Several approaches to program evaluation are of proven value to those who plan and operate job training programs. In general, they can be grouped into two major categories: those approaches that focus upon product, and those that examine process. The models that focus on product are called, with beautiful economy of logic, product evaluation models. They concentrate almost exclusively on program outcomes. Process evaluation, on the other hand, addresses the actual process of instruction and training. This paper will discuss process evaluation as a viable method for reviewing the effectiveness of employment and training programs conducted under the Job Training Partnership Act (JTPA).

The Nature of Process Evaluation

Process evaluation is a method of obtaining information about a training or instructional program by using data gained during the actual conduct of training. The information that is obtained can be used to adjust performance or to predict long term outcomes of the training process. The process evaluation method usually involves an on-site review of training processes. In theory, if we know exactly what is going on, in what sequence, and under what circumstances it is occurring, we can make good predictions about long term outcomes. For example, if we were to conduct a process evaluation of a football team, we would look at the height, weight and quickness of the players, the effect-

iveness and qualifications of the coaches, the soundness of the game plan, the completeness of the training program, nutrition policies, and the facilities. Then we would make indepth observations of the team in practice, its field leadership, cohesive functioning, and talent. After sorting through this data we would not hesitate to make some predictions about the future record of such a team. We would not be correct 100 percent of the time, but we would probably be close.

To be effective, process evaluation must be based upon a clear understanding of the goals and objectives of a program and the ingredients that are needed to achieve them. Often, the goals and ingredients are spelled out by legislation or by a state or local funding agency. Occasionally, they are prepared by the training agent. In any case, the training goals form the blueprint for the process evaluation.

Advantages And Disadvantages Of Process Evaluation

Like other approaches to evaluation, the process approach does have its limitations and drawbacks. The first of these is related to the question of reliability. If the on-site visitation model is used, great care must be taken to insure that the evaluator produces an unbiased report; or if there are multiple evaluators, that there is some degree of interrator reliability. In this respect a check list or other rating form is usually very valuable. It allows the evaluator to concentrate on obtaining the needed information and contributes to reliability among

several evaluators. It also provides a framework for responding to each evaluation question or item.

The other basic problem is validity. We would like process evaluation results to accurately predict long term program outcomes. To the extent that the process evaluation standards are drawn from accurate goal statements about desirable outcomes, the process evaluation should do a good job of predicting long term results. These results can be tested by comparing them to program outcomes at a future time. If thoughtfully conducted, a process evaluation can produce results that are consistent with long term program outcomes. It can indeed be valid as well as reliable.

Why Use Process Evaluation?

Process evaluation should be attractive to JTPA program operators for several reasons. Among those reasons, process evaluation is: (1) diagnostically helpful, (2) cost effective, (3) fast, closing the feedback loop quickly, and (4) provided for in the JTPA legislation. Probably the two most compelling reasons for using a process evaluation model are diagnostic efficiency and the relatively low cost of a well designed process evaluation system.

It Is Diagnostically Helpful

Diagnostic information is essential to employment and training managers who are using the new, innovative, and unusual approaches to training that are permitted and even encouraged by the JTPA legislation. It is vitally important for decision

makers to know early on if something has gone awry with their training plans. It is more important still to know just what is causing the problem so that immediate steps can be taken to deal with small problems before they become big ones. It is here that process evaluation excels. A carefully designed and implemented process evaluation can identify problems long before they show up in outcomes. This gives decision makers time to make adjustments in the training process before their chickens come home to roost. In view of JTPA's concern with program outputs as a measure of effectiveness, it appears that program managers should use process data to fine-tune their operations for maximum output.

A process evaluation system can identify precisely what is going wrong, and just where the malfunction is. Often it can indicate the particular time in the training process something began to go wrong. In this way it can provide clear indicators for remedial action. For example, suppose you find through a process evaluation that the placement staff are having trouble placing trainees in unsubsidized employment because they do not have access to comprehensive listings of manufacturing firms in the service area. Certainly, the placement rate of trainees may suffer because of the lack of suitable numbers of potential employer contacts. This may give rise to pointed inquiries from funding sources, and may even result in a premature termination of the training program. Obviously, you do not wait until this happens before taking remedial action. By obtaining a relatively inexpensive industrial guide or state statistical abs-

tract, however, you can avoid the undesirable outcomes of low job placement. You can use the new information to generate job placements, in this way using the results of a process evaluation to buy the time you need to make adjustments.

It Is Cost Effective

Another good reason for considering process evaluation is its cost effectiveness. In terms of both money and time expended for information obtained, it is way ahead of other techniques. The results of a process evaluation are relatively inexpensive to obtain because it is a direct and short term approach that focuses on observable training activity.

It Closes The Feedback Loop Quickly

The results of process evaluations are available very quickly. Useful information is usually obtained within a few weeks after the observations occur, and with the advent of microcomputer technology and the availability of software, feedback may be almost instant. Decisions based upon the findings can therefore be implemented right away. This is a vastly different time frame than with product evaluation, which must rely on a more longitudinal study of program output. Product studies are time consuming and costly because they are so labor intensive. Their results are often not available until the program cycle is completed, and often this means months or even years before results are available.

Suppose that a product evaluation reveals serious deficiencies in program output. There are still two unsavory

conditions that managers should know about: (1) the product evaluation will probably not show just where the problem was, and (2) even if it does, it may be too late for changes if funds have already been cut as a result of poor productivity. We have all had the experience of taking an examination in school and then waiting weeks or even months for the results. If the feedback was delayed too long we lost interest, and when we finally received it we did not really care any more. The same thing can happen in evaluating training programs. We need to be able to close the feedback loop as quickly as possible by implementing needed program refinements or reforms in time to have a positive effect on the staff and the program. The process evaluation can solve this problem by providing us with the timely information that we need for improvement.

The Law Provides For Process Evaluation

There is also a more pragmatic reason to consider a process evaluation approach, a reason that has its roots in the JTPA legislation itself. In section 54 the law states:

> The Secretary shall provide for the continuing evaluation of all programs, activities, and research and demonstration projects conducted pursuant to the Act, including their cost-effectiveness in achieving the purposes of the Act, their impact on communities and participants, their implications for related programs, the extent to which they meet the needs of persons by age, sex, race and national origin, **and the adequacy of the mechanism for the delivery of services** (emphasis ours).

This general charge to JTPA evaluation personnel refers to both kinds of evaluation practice. It sets the stage for process

evaluation of training programs by suggesting that an effective, useful, and workable evaluation of JTPA programs will use process as well as product evaluation components. It specifies an ongoing program evaluation system to examine the manner in which services are provided and the extent to which the service deliverer is capable of and is providing the services (Brauchle, 1984). However, a process evaluation system is probably the most cost effective and efficient method that program operators can use to meet this requirement in the law.

Some Suggestions From The Literature

Literature specific to the evaluation of employment and training programs has been limited, but several useful observations have been made. One is that outcome variables of social programs are difficult to evaluate because there are often differences between statutory results and those practical to evaluate. Chen and Rossi (1983) stressed the use of policy directed at plausible goals that are consonant with the current knowledge of the problem to which the program is directed. Patton (1981) and Nielson and Turner (1983) suggested that program evaluation techniques should be tied directly to results that are reflected in program goals and objectives. Process evaluation can help maintain this balance.

Perhaps the greatest single implication of the JTPA law, and one that seems to have received little attention in the literature, is the opportunity for local systems to establish their own standards for program evaluation. Under provision of the

law, performance standards may be established at the state or local levels. According to Affholter (1983), this is a very critical issue. The law's emphasis on local goal setting and evaluation now provides local program operators with considerable latitude to design outcome standards and thus to control their own destinies. Careful program operators will set performance goals and objectives that are consistent with their philosophy and their ability to deliver services. They will also specify goals that are observable as they occur so that mid-course corrections can be made.

An effective, useful, and workable evaluation of JTPA programs will therefore use process as well as product evaluation components. It will have the following characteristics:

(1) It will state program objectives in specific behavioral terms that can be measured as the training process unfolds.

(2) It will define the variables to be used in evaluation clearly and precisely.

(3) It will use outside mediators or evaluators to assist in the evaluation process.

(4) It will consider human values and non-monetary aspects of the program.

(5) It will describe and interpret the evaluation results in terms that are useful and understandable to local personnel.

(6) It will include a way not only of describing adequate achievement of objectives but also will recognize exemplary performance.

(7) It will require local goal setting.

Implementing Process Evaluation

For any organization, implementing a process evaluation system is difficult. For JTPA organizations, it can be even more demanding considering their volatile environment caused by short fiscal cycles, and uncertain funding. Under these circumstances, evaluation of local program processes can be very difficult. However, without process evaluation program operators must guess which strategies actually work. Such unscientific review of program operations can lead to costly repetition of the "same old mistakes" and a potential waste of tax dollars.

Process Evaluation: Commitment Plus Curiosity

The organizational climate of the JTPA program must encourage staff commitment to evaluation while reinforcing curiosity about the best training techniques. Byram and Robertson (1970) stated that evaluation requires an administrative commitment of time, money, and staff resources. Regardless of the commitment of these scarce resources, the intangible characteristic of "staff curiosity" must also exist. It is doubtful that any type of evaluation would be an effective diagnostic tool without it.

Additionally, a strong organizational commitment is vital to assuring that evaluation findings will impact on the quality of the program. Often evaluation results receive no administrative follow-up, thus subverting desirable program changes. Rossi (1971) stated that this occurs due to the relatively low organ-

izational prestige of evaluation research. As result, evaluation findings often have little impact on programs and are frequently diffused to a limited audience.

Implementing Process Evaluation

There are many variations of accepted evaluation practice. Second in importance to creating and maintaining an appropriate organizational environment, is choosing among evaluation alternatives. The following is a brief discussion of several possible choices faced by program operators when implementing process evaluation.

What to evaluate. A program can only be evaluated against the purpose for which it was intended (Mangum and Snedeker, 1974). Critics of educational evaluation often suggest that failure to evaluate results from poorly defined, or even non-existent program objectives (Wenrich and Wenrich, 1974). Clearly, many JTPA programs have poorly developed or non-existent objectives. When fully developed, program objectives are the blueprint for implementing a process evaluation system.

Selecting Appropriate Measures. The JTPA program planner is faced with choices among many evaluation measures. Mangum and Snedeker (1974) suggested the following criteria to be helpful:

(1) Measures should be keyed to specific goals, objectives, and operational indicators.

(2) Simple measures should be favored over more complex measures.

(3) Measures which can meet local (SDA), and federal needs and also the needs of program

operators are preferred over measures which meet only one type of need.

(4) The Costs of obtaining the information should be less than the cost of not getting it.

(5) Objective, quantitative measures are to be preferred to subjective judgments whenever available.

Which Evaluation Procedure. Lessinger (1970), suggested a three step approach that assurs program accountability. Those steps were: (1) framing performance criteria for each program, (2) obtaining an independent educational accomplishment audit to measure the actual performance against these criteria, and (3) providing for the auditor to make a public report of his findings. The American Vocational Association in cooperation with the U.S. Office of Education has developed both instruments and procedures for evaluation and accreditation of vocational institutions and programs. The AVA also suggested a three step evaluation procedure including: (1) a self-evaluation study, (2) a subsequent visiting team of evaluators, and (3) a concluding review by an independent third group (Ash, Kempfer, and McNeil, 1971). Each of the AVA's three steps are discussed in the following paragraphs.

The self-evaluation study. Using identical criteria, local program staff conduct a systematic analysis of program operation and procedures prior to outside evaluation. This pre-evaluation activity affords new perspectives and insights into the program.

Additionally, program operators staff has an opportunity to examine alternative courses of action.

The visiting evaluation team. A team of evaluators made up of representatives from a variety of institutional sources (including industry, other vocational education programs, etc), verify the accuracy of the self-evaluation study. While on-site, the team (1) checks the extent that reported data gives an accurate picture of actual conditions, (2) verifies the extent outcomes coincide with stated objectives and (3) checks the adequacy of the program's management system for producing needed data for accurate decision making.

The independent review of findings. A third and independent group helps bring about comparability in the application and interpretation of results. This permanent review body, drawing on its broader experience, resolves and mediates differences of opinion between program personnel and on-site evaluators.

Integration Of Evaluation Findings. The only purpose of evaluation is to modify the program by the results of the evaluation (Mangum and Snedeker, 1974). All too frequently, however, evaluation findings are not used to contribute to program improvement. To assure integration of evaluation findings (along with other essential program planning information), the Missouri Department of Elementary and Secondary Education (1981) recommended the development of a formalized program of work. The suggested plan should include the following aspects:

(1) Define each priority in terms of one or more objectives that detail what is to be accomplished.

(2) Spell out indicators of success for each objective. These state the evidence that will be accepted as indication of achievement of the objectives.

(3) Itemize the tasks necessary to accomplish each objective in chronological order and specify deadlines for their accomplishment.

(4) Assign specific personnel to each task and alert them to the deadlines.

(5) Monitor progress and conduct periodic follow-up as to goal achievement for re-direction/reassignment where necessary.

Implementation of a formalized program of work allows the program's administrator a systematic method of assuring that evaluation findings are fully integrated into future operations.

Problems In Implementing Process Evaluation

A JTPA program operator implementing a process evaluation system will face many problems. The section that follows is a brief encapsulation of just a few of them.

Organizational Problems

Utilization of limited resources. Due to financial limitations, most JTPA staffs are now reduced. As result, staff time for evaluation is at a premium. Writing a quality evaluation report is time consuming and thus expensive. When considering the multiple programs most SDAs must evaluate, allocation of staff time for this purpose becomes a major consideration.

Consequently, many program operators restrict evaluation to analysis of program outcomes or its products.

Evaluating Poorly Defined Program Objectives. Well developed program objectives, stated in behavioral terms, are frequently absent from JTPA programs. By the term "behavioral objectives" we mean summary statements of WHAT behavior is expected to happen, HOW it will occur, and HOW WELL it will be accomplished. Unless objectives contain such elements, true assessment of their accomplishment is not possible.

Technical Problems

Lack of appropriate process evaluation measures. Even after complete program objectives have been developed, valid and reliable measures of program processes must be created. Valid measures accurately assess what they claim to measure and reliable measures produce similar findings from one administration of the criteria to the next. As you might expect, this is a very sophisticated and time consuming task. Many JTPA administrators do not have sufficient resources to develop such detailed evaluation tools.

Establishing a process evaluation procedure. JTPA programs do not have a long and rich history of process evaluation at the local level. As result, procedures for evaluation are also not well developed. For maximum utility, such procedures should be characterized by: (1) responsiveness (to provide evaluation findings early in the program cycle), and (2) fairness to program operators.

Report writing. The initial, and perhaps most important, step in integrating findings into evaluated programs is the preparation and distribution of preliminary and final evaluation reports. For the evaluator, writing a report is labor intensive and time consuming. It is likely that from ten to thirty staff hours may be invested in a single report, also making it expensive.

Problems Of Attitude

Maintaining a positive evaluation atmosphere. Many JTPA staff and program operators view evaluation as a negative experience. This is understandable; yet, such an undesirable attitude can be very durable and difficult to change. However, if staff acquires a positive orientation about the purpose and benefits of process evaluation, they will also view it as an important and necessary tool for doing better work.

Specifications For A Potential Solution

As a group, JTPA program operators do not frequently utilize process evaluation techniques. This is due primarily to the system-wide emphasis that is placed on program outcomes. Also contributing are current financial limitations. Although these are real limitations, the quality of JTPA instruction cannot be substantially improved until something like process evaluation principles are utilized in conjunction with current product oriented evaluation practices.

There are four key areas in which potential solutions for this problem can be found. Those areas are: (1) computerization

of evaluation activities, (2) standardization of process evaluation criteria and processes, (3) independent local evaluation, and (4) enhanced staff attitudes towards evaluation.

Computerization of Evaluation Activities

Recent technological advances offer some hope to JTPA administrators in making process evaluation more efficient. Those hopes are found in a new generation of microcomputers. For the first time, increased capacities of today's microcomputers permit their use in program evaluation. Among these technological innovations are increased capacity for: (1) portability and networking, (2) artificial intelligence, and (3) accelerated evaluation feedback (report writing).

Portability and networking. With the recent announcement of a new generation of laptop computers, electronic process evaluation can now be conducted at the program site. These new machines can equally be used for self-study, on-site evaluation and independent review of findings. It is conceivable that evaluation findings will be entered into specially developed software, generating a finished report within minutes, not weeks or even months. Obviously, this speeds the evaluation feedback cycle, allowing program operators to implement evaluation findings while there is still time for program improvement.

Centralized JTPA organizations such as state SDAs and state departments of education can utilize improved computer networking capabilities to gather and integrate evaluation findings into larger data files. This can be accomplished using a simple and

inexpensive telephone modem. Inter and intra program comparisons on universal performance criteria could then be made.

Artificial Intelligence. Herman and King (1985), defined artificial intelligence in terms of computer applications that use symbolic knowledge to simulate the behavior of human experts. This form of artificial intelligence depends on the use of propositional logic, in which all statements are either "true" or "false". In this logic system common propositions (evaluation findings in our case) are linked together with computer connectives, allowing computer language based inference and control strategies to guide a knowledge system utilizing facts and rules also stored in the computer program. The use of propositional logic in special evaluation software allows the computer to analyze data for consistent patterns among pre-determined themes. Subsequently, the values assigned to those items are summed and compared to pre-established minimum and maximum standards. For example, when the summed values of ratings for selected evaluation items exceed 66% of the total possible value, the control of the computer is transferred to another part of the program causing it to print various messages. The message printed would depend upon the assigned value for individual evaluation questions. Such control strategies could be used to analyze evaluation findings for the purpose of making observations about program strengths and weaknesses.

Accelerated Evaluation Feedback. Portable laptop computers, using special evaluation software, would allow immediate report

generation. Some models are equipped with built-in printers, while others can be connected to free standing printers. As a conservative estimate, a fifty page evaluation report can be generated by a typical dot matrix printer within ten to twenty minutes. This capability would allow program administrators and/or evaluators to generate reports of evaluation findings before leaving the evaluation site, thus accelerating feedback of results.

Standardization Of Evaluation Criteria And Processes.

Clearly JTPA is subjected to uniform standards for program performance (i.e., job placements, etc.). Unfortunately, there are no uniform standards for JTPA educational practices. As a result, the quality of JTPA instruction varies greatly from one program to another. For example, in many instances, JTPA vocational curricula are not highly documented. Often instruction is provided without benefit of student oriented lesson objectives or daily lesson plans. Uniform process evaluation criteria would certainly point out this major flaw. An evaluation finding of this nature could lead to dramatically increased precision in JTPA instruction.

When discussing evaluation with a group of JTPA administrators, one quickly finds that evaluation means vastly different things to each individual. One solution is to develop at the state or even federal level a uniform process evaluation procedure. This procedure should be similar to existing accredi-

tation models which include the concepts of (1) self-study, (2) on-site evaluation, and (3) independent review of findings.

Many perceive the development of uniform process evaluation criteria and processes as limiting to the innovative intention of the JTPA legislation. In actuality, such criteria and procedures are not prescriptive. Uniform evaluation would provide the JTPA delivery system with a common measuring stick for assessing the efficiency and effectiveness of program innovation.

Independent Local Evaluation

Even in the event of the development of a state or even federal evaluation activity, local program operators must still consider process evaluation a primary management function. When process evaluation is fully integrated into the management of JTPA, program operators will be forced to develop more sharply defined program goals and objectives. Only in this way will they be able to accurately assess their accomplishments or recognize exemplary performance.

Enhanced Staff Attitudes Towards Evaluation

If process evaluation is to be effective, it must be a participative activity. Managers of JTPA programs cannot simply prescribe program improvement. Individual staff members must take responsibility for the implementation of evaluation findings while doing their jobs. For this to occur, staff's perception of evaluation must be positive. Conversely, management must have the perception that evaluation is a viable method for improving

program performance and choosing among alternative delivery methods.

Such positive management and staff attitudes can be developed when evaluation is: (1) an expected or routine part of program operation, (2) a mutual activity between the SDA, program management, and service delivery staff, and (3) treated by management and staff as a form of in-service training.

Summary

It is politically incumbent upon SDA administrators and PIC members to make wise choices in the allocation of their limited resources. Yet, in many cases empirical data are not used in making these choices among alternatives. Dressel (1961) points out that when an administrator is faced with making a program choice of almost any type, evaluation is automatically present. Further, if one fails to engage systematically in evaluation, decision by prejudice, tradition, and rationalization is paramount (Dressel, 1961).

Process evaluation represents an important management tool available to managers of JTPA programs that can be used for program improvement. While process evaluation instruments and procedures are limited by concerns with validity and reliability, there are many advantages. Among those advantages, process evaluation: (1) is helpful in diagnosing problems before they become serious, (2) is cost effective, and (3) closes the performance feedback loop quickly.

JTPA managers implementing a process evaluation system must make many choices. Primarily those choices are: (1) what to evaluate, (2) selecting appropriate evaluation measures, (3) selecting an evaluation procedure, and (4) how to integrate evaluation findings for program improvement.

Specifications for the solution of problems encountered when implementing process evaluation include: (1) computerization of evaluation activities, (2) standardization of process evaluation

criteria, (3) independent local evaluation, and (4) enhanced staff attitudes towards evaluation.

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